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SUBJECT: DOE A/S Karsner Explores Renewable Energy Research in Israel

¶1. (SBU) Summary. U.S. Department of Energy Assistant Secretary Alexander Karsner visited Israel May 19-24 to explore alternative and renewable energy research and production. He and his team met with academic and private sector researchers, as well as companies already selling renewable energy generating equipment and venture capital firms investing in new technologies. Karsner signed with the Director General of the Ministry of National Infrastructure an Implementation Agreement that advances the new US-Israeli joint Energy Research Cooperation program. On May 21, Deputy A/S Steve Chalk addressed an Alternative Energy Conference held at Tel Aviv University. The visit opened many new avenues for cooperation on biofuels, fuel cells, solar energy and energy storage technologies, and many Israeli researchers expressed interest in visiting the National Renewable Energy Laboratory and other DOE lab facilities. End Summary.

¶2. (SBU) Assistant Secretary for Energy Efficiency and Renewable Energy Andy Karsner visited Israel May 19-24 to explore the variety of renewable and alternative energy research underway, and to further clarify with the GOI how implementation of the new joint energy research program should proceed. Karsner was joined by Deputy A/S Steven Chalk, Senior Advisor Michael Bruce, Energy Policy Analyst Scott Pugh, and NREL Manager of Intergovernmental Programs Ron Benioff. The DOE team accompanied by Embassy ESTH officer met a broad cross-section of Israel's private sector producers and investors, academic researchers, and government policymakers engaged in alternative energy work.

¶3. (U) Karsner's visit to Israel coincided with a Tel Aviv University Conference on Renewable Energy. This conference, opened by the Ambassador, featured an address by Deputy Assistant Secretary of Energy Steve Chalk. In his address, Chalk outlined the USG policies for achieving greater energy independence for the United States, and noted the avenues of technology research that DOE is pursuing. He also highlighted the new Bilateral US-Israel energy research program for which A/S Karsner signed the Implementation Agreement during his visit.

Rethinking Israel's Energy Future

¶4. (SBU) On May 21 Karsner met with GOI Minister for National Infrastructure Binyamin Ben-Eliezer in Jerusalem.
The Minister outlined Israel's energy constraints: little domestic energy sources but for a small amount of natural gas in the Mediterranean, and plentiful sunshine. Currently 70 percent of electricity is coal generated, and carbon sequestration technology could be done (at some cost) to make this more environmentally friendly. A transition to cleaner natural gas has been started, but this does not diminish the country's vulnerability to imported energy suppliers. The Minister said he expects more reliance on solar in the future, and will commit Israel to 20 percent savings on its energy use off a 2006 base by 2020. He has also established a stretch goal of 20% of electricity from renewable energy by 2020.

¶5. (SBU) Karsner thanked the Minister for GOI cooperation in preparing the new bilateral energy research program, and for signing the Memorandum of Understanding establishing that program in March when Ben-Eliezer visited Washington. Karsner noted Israel's impressive solar technology, and encouraged Eliezer to consider more solar-powered generation. With the Ministry's Director General Hezi Kugler, Karsner later signed an Implementation Agreement related to the MoU on energy research. Karsner encouraged Kugler to be aggressive in the scope of their upcoming CSP solicitation to enhance industry interest, seeking bids for up to 2500mw of solar-generated power. Because the GOI covers the risks of land acquisition, permits, and grid purchase price, investors would be willing to bear financial, commercial and technical risks and will be interested in participating if the scale of the opportunity is large enough. Kugler accepted Karsner's offer to have NREL conduct a quick study of policy options for attracting large scale renewable energy investment to Israel. (Note: This study is already underway.)

Private Sector Charging Ahead

¶6. (U) The DOE team visited Solel Solar Systems in Beit Shemesh. CEO Avi Brenmiller briefed Karsner on Solel's technology utilizing parabolic mirrors that concentrate solar energy onto solar thermal receivers containing a heat transfer fluid. This fluid is circulated and heated through the receivers, and the heat is released to a series of heat exchangers to generate super-heated steam which drives a turbine to generate power. Solel has sold this technology in several countries, including a commercially competitive plant in California. The size of foreign market demand needed to merit investment in production facilities abroad was

discussed, and Brenmiller did not rule out such investment in the US. Solel is developing a 1 MW integrated CSP test system and is interested in partnering with the U.S. in the use of this system. The DOE delegation noted interest in potential collaboration on solar thermal storage and Solel promised to share ideas for collaboration with NREL.

¶7. (SBU) Karsner and officials also met with various renewable energy investment firms, including Cleantech Ventures, Tamir Fishman, and Precede Technologies and with several companies including Project Better Place, Emefcy Bio-Energy Systems, CellEra, Bright Source, Bright View Systems, and the Israeli Electric Company.

Academic Researchers Engaged

¶8. (U) The DOE team visited several of Israel's leading universities where renewable energy research is underway. At Hebrew University's Faculty of Agricultural and Environmental Science they were briefed by Dean Eli Feinerman and Prof Sam Saguy on current research. Prof. Yitzhak Hadar detailed his work using fungal enzymes to promote cellulosic fermentation to produce biogas. Prof. Oded Shoseyev discussed research on genetic engineering to produce trees with enhanced biomass and bio-ethanol generating capacity.

¶9. (U) At the Weizmann Institute, DOE officials met with Prof. Dan Yakir, Head of the Department of Environmental Sciences and Energy Research, who led discussions on facilitating biogas production through enzyme research. Professors Ed Bayer, Avihai Danon, and Uri Peck participated. Professor Michael Epstein detailed his work on solar energy, and described the Weizmann Institute's solar energy tower, that can generate up to 3 megawatts of solar power focused on faculty experiments. Aside from the existing solar power technology of parabolic mirror enhanced thermal generation, Epstein discussed enhanced photovoltaic research and thermal storage technology. Weizmann scientists expressed great interest in continuing contact with DOE researchers at NREL and other labs in the US.

¶10. (U) At the Technion/Israel Institute of Technology Karsner's delegation was briefed by Technion President Yitzhak Apeloig on his institution's pivotal role in Israel's infrastructure and engineering history. Technion graduates are responsible for much of the country's constructed environment and power and water systems,

and currently lead most Israeli high-tech research companies. Professors Gideon Grader and Avner Rothschild outlined Technion's energy research as having four components: Alternative fuels, such as hydrogen production and biofuels; renewable energy such as solar dessicant cooling and enhanced photovoltaics; energy storage through fuel cells, batteries, and thermal technologies; and energy conservation through architectural and industrial efficiency. Grader himself focuses on materials science engineering, particularly in ceramics that can enable the construction of ultrahigh temperature solar boiling vessels.

11, (U) Technion Professor David Hasson presented work he and Rafit Semiat are doing on membrane desalination, which works to improve the technology already deployed in Israel's largest desalination facilities. DOE officials later toured the world's largest desalination facility in Asheklon, operated by IDE Technologies, that produces 330,000 cubic meters of water per day. IDE's use of a vacuum desalination process that produces ice may also hold good potential as part of a integrated thermal storage system. IDE was invited to visit NREL to further explore potential collaboration and this visit is currently being planned.

Forming Ongoing Liaisons

¶12. (SBU) Many of the academic researchers the team DOE met with hope to continue discussions with their American counterparts, both university and government based. To facilitate liaison with Israeli academic researchers, Karsner urged them to work together, perhaps forming a loose consortium among themselves. This would avoid duplication of efforts and speed communication with DOE. Ultimately, the selection of research projects for funding under the new bilateral program will be aided by having a single counterpart to the DOE National Renewable Energy Labs.

¶13. (SBU) In concluding discussions with GOI Ministry of Infrastructure DG Kugler, Karsner suggested that the existing Binational Industrial Research and Development Foundation (BIRD) offers a promising vehicle through which to channel part of the joint research funds. During the visit Karsner had met with BIRD Executive Director Eitan Yudilevitch, who described the BIRD model for supporting projects that team Israeli and U.S. firms on developing and commercializing innovative technologies and enable

the recapture of BIRD funds when commercialization is successful. This would capitalize on BIRD's established capacity for developing and managing bilateral projects between U.S. and Israeli companies.

¶14. (U) The Department of Energy reviewed and cleared this cable.

JONES